



## New England Fishery Management Council

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### MEMORANDUM

November 10, 2010

TO: Council Members  
FROM: Science and Statistical Committee  
SUBJECT: Five-Year Research Priorities, 2011-2015

The research recommendations below were derived from research recommendations provided by the SSC in 2009, from the research needs identified by FMP Committees and PDT's (Pat Fiorelli's memo for the June 2010 meeting), and from SSC discussions in June 2010. The list was consolidated and prioritized at the November 2010 meeting of the SSC.

1. Incorporate risk assessment in quantifying uncertainty in the ACL/AM setting process. Risk assessment would help the Council agree on the risk it is willing to tolerate in making tradeoffs between the potential harm due to overfishing and the expected cost of lost yield. Risk assessments needs to be incorporated for target fish populations and for specific compartment of the fishing industry, but also for other fisheries, other types of fishery (e.g. recreational vs. commercial), and other priority concerns, such as threatened and endangered species. Setting ABC to incorporate the risk of damage to fish stocks (e.g. overfishing) and to the ecological environment and the risk of damage to the fishery (loss in yield) involves making trade-offs. Use social science research to estimate supply and demand factors to improve on using catch data to set ABC in data poor fisheries where catches are suspected of being underestimated because the catch history was constrained by factors other than stock biomass. Use this approach to quantify past catches where these are considered poorly estimated (e.g. monkfish).

Action Plan: A workshop for the SSC and the NEFMC to incorporate social science into risk assessment in setting the precautionary buffers between OFL and ABC and between Annual Catch Limit and Annual Catch Target.

2. Design Ecosystem Based Fishery Management plans (EBFM) for implementation by the Council in the context of Ecosystem Based Management (EBM) and the National Ocean Policy framework, incorporating biological, social, economic and institutional factors. EBFM implies trade-offs between damage (costs) and benefits between various fisheries

and between fisheries and other users of ecosystem-based services in order to achieve pre-agreed objectives. Agreeing on trade-offs requires decision making processes among stakeholders and with other segment of society that use metrics other than dollar value. Use social science research to estimate impacts on fishing communities and the Integrated Ecosystem Assessments, required in designing and implementing EBFM. Use social science research to allow more direct input from stake holders in the decision making process and make it possible to agree on trade-offs. Investigate processes and trade-offs in the choice of harvesting / rebuilding strategies of various species of predators, prey and competing species.

3. Management measures in the Northeast Multispecies (Large Mesh/Groundfish) Fishery Management Plan have become increasingly restrictive starting with Amendment 5 in 1994 with large areas being closed to fishing, substantial reductions in the days-at-sea and significant increases in mesh sizes. The perception is that benefits expected from these measures have not been fully met since further restrictions have subsequently been necessary. Evaluate the extent to which the benefits have been met and formulate and evaluate hypotheses to explain the differences between the expectation and the results of management actions.
4. Retrospective patterns have been major impediments to the formulation of advice (e.g. Atlantic herring). The issue has been thoroughly investigated by the Northeast Fisheries Science Center (<http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0901/crd0901.pdf> ). Retrospective patterns are an indication that something is inconsistent in the data or model assumptions and simulation analyses have demonstrated a number of sources for retrospective patterns, including missing catch, changes in natural mortality rate, and changes in survey catchability. Use management strategy evaluation to provide guidelines on how to use assessments that suffer from retrospective patterns or where the assessment has been “corrected” for the retrospective pattern in the formulation of management advice, taking into account the possible consequences of being wrong.
5. Develop reliable indices of abundance for red crab, pollock, herring, mackerel, wolfish and cusk. Investigate the existence of pollock cryptic biomass, including age/size based estimates of catchability. For red crab, gather or recover data from the fishery to improve the stock assessment.
6. Quantify discards, discard mortality and incidental mortality from interaction with the fishing gear. Identify and evaluate methods to reduce by-catch of all species (with particular emphasis on endangered, threatened and protected species) through gear research and other technical measures and time and area based measures.

7. Advance research on basic biology of fishery resource populations:
  - a. Improve knowledge on stock definition, stock movements, mixing, and migration through tagging studies, DNA markers, morphological characteristics and other means, focusing on: (a) short- and long-term movements, and (b) habitat use in relation to broad scale movements, with priority for monkfish, cod, pollock, silver hake and herring. Investigate localised depletion for species in FMPs, particularly for Atlantic herring.
  - b. Improve the knowledge on (a) age and growth, (b) longevity, (c) reproduction, and (d) natural mortality with priority placed on monkfish, skates, wolfish, red hake and red crab.
8. Identify and evaluate methods to reduce habitat impacts, including, but not limited to, broader investigation of variability in gear efficiency across habitats, time, area, and gear design.
9. Evaluate the cost and benefits of generating social and economic data streams parallel to that of fish to understand how the industry works, identify the economic drivers that affect fleet behaviour and make recommendations on the implications for individual sectors of various management options.

In addition to these nine research priorities, the SSC also recommends research on the following topics, which are not prioritized.

- Investigate the effect of size dependent demand curves on revenue per recruit.
- Review experiences/processes used regionally, nationally and internationally in identifying goals and objectives (social, economic and otherwise) in support of ecosystem based management/EBFM. Summarize findings from NE regional initiatives (e.g. EBM workshops 2005; fleet visioning 2005; SSB M & E performance measures).
- Investigate the feasibility and utility of voluntary mechanisms to temporarily or permanently reduce fishing pressure.
- Identify and evaluate the major sources of management uncertainties in setting ACL.
- Review, evaluate, and recommend practical means to improve compliance with regulations.
- Evaluate mechanisms, including taxes, to provide incentives for fishermen to keep bycatch that would otherwise be discarded while not providing incentives to target these species, i.e. evaluate the opportunity costs of keeping the bycatch rather than discard it.
- Review, evaluate and recommend practical means of increasing the economic benefits from the fishery from a given amount of fish to be caught.
- Develop a cost and revenue curve for the multispecies groundfish fishery in order to identify optimum yield for the aggregate fishery.
- Conduct research on the habitat effects from fishing and develop practicable methods to minimize or mitigate those impacts.